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CIVIL RESERVE AIR FLEET:  
LOOKING FROM DESERT STORM TO THE FUTURE

BY

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U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

92-14974



92 6 05 111

Unclassified

## SECURITY CLASSIFICATION OF THIS PAGE

| REPORT DOCUMENTATION PAGE  |       |  |  | Form Approved<br>OMB No. 0704-0188                     |                             |
|--|-------|--|--|--|-----------------------------|
| 1a. REPORT SECURITY CLASSIFICATION<br>Unclassified   |       |  | 1b. RESTRICTIVE MARKINGS   |  |                             |
| 2a. SECURITY CLASSIFICATION AUTHORITY  |       |  | 3. DISTRIBUTION/AVAILABILITY OF REPORT<br><b>Approved for public release<br/>distribution unlimited.</b> |  |                             |
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE  |       |  |  |  |                             |
| 4. PERFORMING ORGANIZATION REPORT NUMBER(S)  |       |  | 5. MONITORING ORGANIZATION REPORT NUMBER(S)  |  |                             |
| 6a. NAME OF PERFORMING ORGANIZATION<br>U.S. Army War College   |       | 6b. OFFICE SYMBOL<br>(If applicable)     | 7a. NAME OF MONITORING ORGANIZATION  |  |                             |
| 6c. ADDRESS (City, State, and ZIP Code)<br>Carlisle Barracks, PA 17013-5050  |       |  | 7b. ADDRESS (City, State, and ZIP Code)  |  |                             |
| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION  |       | 8b. OFFICE SYMBOL<br>(If applicable)     | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER  |  |                             |
| 8c. ADDRESS (City, State, and ZIP Code)  |       |  | 10. SOURCE OF FUNDING NUMBERS  |  |                             |
|  |       |  | PROGRAM<br>ELEMENT NO.   | PROJECT<br>NO.   | TASK<br>NO.                 |
|  |       |  |  |  | WORK UNIT<br>ACCESSION NO.  |
| 11. TITLE (Include Security Classification)<br>Civil Reserve Air Fleet: Looking from DESERT STORM to the Future  |       |  |  |  |                             |
| 12. PERSONAL AUTHOR(S)<br>Lieutenant Colonel William H. Sessoms and Lieutenant Colonel Thomas J. Maxson  |       |  |  |  |                             |
| 13a. TYPE OF REPORT<br>Group   |       | 13b. TIME COVERED<br>FROM _____ TO _____ |  | 14. DATE OF REPORT (Year, Month, Day)<br>15 April 1992 |                             |
| 15. PAGE COUNT<br>65   |       |  |  |  |                             |
| 16. SUPPLEMENTARY NOTATION   |       |  |  |  |                             |
| 17. COSATI CODES   |       |  | 18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)                        |  |                             |
| FIELD  | GROUP | SUB-GROUP                                |  |  |                             |
|  |       |  |  |  |                             |
|  |       |  |  |  |                             |
| 19. ABSTRACT (Continue on reverse if necessary and identify by block number)<br>Based on American experience dealing with both the Berlin Airlift and the Korean War, it became apparent that the Department of Defense did not possess enough organic airlift capability to meet the full range of possible contingency needs facing the nation. In 1951 President Truman signed Executive Order 10219 bringing into being the Civil Reserve Air Fleet (CRAF). The voluntary CRAF program effectively marshals the full range of national airlift assets, civilian and military, to meet national contingency needs. Organized in three stages, CRAF augments the organic military airlift assets of the Military Airlift Command with over 500 commercial airliners drawn from U.S. industry. Although the CRAF program became a cornerstone of the nation's strategic mobility programs, it remained untested until 17 August 1990 when it was activated to support OPERATION DESERT SHIELD and OPERATION DESERT STORM. In its first activation, CRAF flew over 5,400 missions. With its first activation, predictably, some problems did surface, but the concept proved viable. This study reviews the mechanics of the program, some of the lessons learned from the |       |  |  |  |                             |
| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT<br><input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS  |       |  | 21. ABSTRACT SECURITY CLASSIFICATION   |  |                             |
| 22a. NAME OF RESPONSIBLE INDIVIDUAL<br>DONALD W. BRUCE   |       |  | 22b. TELEPHONE (Include Area Code)<br>717-245-3191   |  | 22c. OFFICE SYMBOL<br>AWCAC |

Block 19. Abstract (Cont.)

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USAWC MILITARY STUDIES PROGRAM PAPER

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CIVIL RESERVE AIR FLEET:  
LOOKING FROM DESERT STORM TO THE FUTURE

**A GROUP STUDY PROJECT**

by

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Carlisle Barracks, Pennsylvania 17013

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| NTIS CRA&I         | <input checked="checked" type="checkbox"/> |
| DTIC TAB           | <input type="checkbox"/>                   |
| Unannounced        | <input type="checkbox"/>                   |
| Justification      |  |
| By                 |  |
| Distribution /     |  |
| Availability Codes |  |
| Dist               | Avail and/or Special                       |
| A-1                |  |

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AUTHORS: William H. Sessoms, Lt Col, USAF  
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TITLE: Civil Reserve Air Fleet: Looking from DESERT STORM to  
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FORMAT: Group Study Project

DATE: 15 April 1992 PAGES: 65 CLASSIFICATION: UNCLASSIFIED

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## ACRONYM LISTING

|          |   |
|----------|---|
| ALCE     | Airlift Control Element   |
| ALCS     | Airlift Control Squadron  |
| BOCCA    | Bureau of Coordination of Civil Airlift                                   |
| CALM     | Computer Assisted Load Manifest   |
| CAT      | Crisis Action Team  |
| CINCS    | Unified Commanders in Chief   |
| CONUS    | Continental United States   |
| CRAF     | Civil Reserve Air Fleet   |
| DOD      | Department of Defense   |
| DOT      | Department of Transportation  |
| FAA      | Federal Aviation Administration   |
| GDSS     | Global Decision Support System  |
| ILOC     | (U.S.-Canadian) Integrated Lines of Communication                         |
| JCS      | Joint Chiefs of Staff   |
| JULLS    | Joint Universal Lessons Learned   |
| KAL      | Korean Air Lines  |
| LMI      | Logistics Management Institute  |
| MAC      | Military Airlift Command  |
| MHE      | Materiel Handling Equipment   |
| NAPCAP   | North Atlantic Treaty Organization<br>Precommitted Civil Aircraft Program |
| NATO     | North Atlantic Treaty Organization  |
| OET      | Office of Emergency Transportation  |
| TRANSCOM | United States Transportation Command (also<br>called USTRANSCOM)          |
| U.S.     | United States   |

|            |   |
|------------|---|
| USCENTCOM  | United States Central Command                               |
| USTRANSCOM | United States Transportation Command (also called TRANSCOM) |
| WASP       | War Air Services Program                                    |

## **INTRODUCTION**

The Civil Reserve Air Fleet (CRAF) was activated for the first time in its history on 17 August 1990 in response to Iraq's invasion of Kuwait earlier in the month. The CRAF response and participation in the deployment of troops to the Persian Gulf underscored the importance of the CRAF program to the national security strategy of the United States. The value of this important program should not be underestimated. However, the history of the CRAF program and its contributions to overall defense capabilities are not well-known except to a small group directly involved with the program. The remainder of this introduction will examine how the CRAF started, the national CRAF policy and the significance of the CRAF program to the mobility requirements of the United States (U.S.).

## **ORIGINS OF CRAF**

The CRAF program's origins can be traced to the airlift lessons learned in World War II, the Berlin Airlift and the Korean War. From these actions it was evident the United States' military did not possess sufficient organic airlift assets capable of meeting certain contingency requirements. As a result, in 1951, President Truman issued Executive Order 10219 directing the



Department of Commerce and the Department of Defense (DOD) to work together and establish a plan which would best utilize civil air aircraft in times of national emergency.<sup>1</sup> In part, Executive Order 10219 stated:

"The Secretary of Commerce shall in utilizing the functions vested in him by law, including those under the Defense Production Act of 1950:

(a) Assemble and analyze data on the requirements of civil air transportation and of the Department of Defense for aircraft of the types used by civil air carriers.

(b) Formulate such plans and programs, and initiate such actions as may be desirable to meet the requirements for civil air transportation and for the types of aircraft used by civil air carriers including plans and programs for (1) the transfer or assignment of aircraft from civil air carriers to the Department of Defense when required to meet the needs of the armed forces approved by the Director of Defense for Mobilization, and (2) such redistribution as may be necessary of the remaining aircraft among civil air carriers to assure the maintenance of essential civil routes and services.

(c) Allocate aircraft ... used by the civil air carriers... to meet the needs of the armed forces..."<sup>2</sup>

From President Truman's Executive Order of 1951, the CRAF program has evolved into a cornerstone of this nation's airlift policy.

#### **CRAF POLICY**

The importance of airlift, including that of the CRAF, was recently emphasized by the Honorable Robert H. Moore, Director of Transportation Policy, Office of the Assistant Secretary of Defense. Commenting on CRAF policy, he stated:

"The CRAF program is based on a long-standing national policy to rely to the maximum extent practical on the civil sector for transportation support in both peace and times of crisis or war. This policy was restated by President Ronald Reagan in the national airlift policy published on 24 June 1987. Under this policy, the Department of Defense maintains and operates the military airlift capability required to satisfy core needs, while commercial carriers provide the airlift required beyond that. The policy also requires other government agencies to ensure that the civil air industry remains economically sound and capable of supporting the national interest and military airlift needs."<sup>3</sup>

The CRAF is still an integral part of the military airlift system the United States depends heavily on to support its vital interests around the world. But how large is this contribution and is it significant compared to the organic capability of the military?

#### **CRAF SIGNIFICANCE**

The United States Air Force, including the Air Force Reserve and Air National Guard, has a very capable fleet of strategic and tactical airlift aircraft. On the strategic side, there are over 400 C-5, C-141 and KC-10 aircraft. Tactically, there are over 450 C-130 aircraft.<sup>4</sup> This enormous fleet, however, does not come close to satisfying all airlift requirements of an operation like DESERT SHIELD/DESERT STORM. The cost for the military to buy and operate the airlift assets to meet these requirements would be prohibitive. The CRAF program provides access to much needed additional airlift capacity during contingencies and war. CRAF also allows the Department of Defense to realize a significant cost avoidance. The

Military Airlift Command (MAC) avoids a substantial investment in aircraft, people, and facilities by relying on the resident capability of the nation's commercial airlines fleet.

What would it cost the United States' government to buy such a capability? Some estimates place the cost of buying the aircraft presently in the CRAF program as high as \$50 billion. However, this figure addresses only the hardware costs. This figure does not include the cost of crews to fly the aircraft or the cost of the maintenance, spares, infrastructure, and other associated people needed to support the larger fleet of aircraft.<sup>5</sup> Colonel Ronald Priddy, Chief of the CRAF program at Headquarters, Military Airlift Command, explains that the CRAF program is really a bargain to the government and the taxpayers:

"It's more than just crews and airplanes....the Department of Defense has at its disposal an entire lift system--enroute maintenance, spare parts, all kinds of partnerships out there..."<sup>6</sup> This civilian airfleet proved its worth during DESERT SHIELD/DESERT STORM. Ms. Diane Morales, Deputy Assistant Secretary of Defense for Logistics, emphasized the contributions of the CRAF compared to the overall airlift effort. She pointed out that almost 70 percent of the passengers and 20 percent of the cargo moved to the Gulf by air traveled by civil air. For the redeployment, 87 percent of the passengers and 43 percent of the cargo were transported by the civil air carriers.<sup>7</sup>

## **SUMMARY**

The CRAF program grew from a realization in the 1940s and 1950s that the military does not own enough airlift to meet each of the contingency commitments the United States might encounter throughout the world. Since then, the CRAF has remained a vital element of our mobilization and mobility planning. CRAF's contribution was recognized in the national airlift policy of 1987 and, more recently, was demonstrated in DESERT SHIELD/DESERT STORM. We have and will continue to depend on the significant capability the CRAF offers. The next section examines further how the CRAF is organized, and how it operates in peacetime.

## **ORGANIZATION**

The CRAF is both a peacetime and wartime partnership. In peacetime, the civil air carriers provide the Department of Defense passenger and cargo movement daily. These same carriers are the ones that augment the military's organic airlift capability in times of national emergency or war. This section outlines the CRAF program and its relationship with the various government agencies. It examines how CRAF aircraft are divided into segments based on range and missions and how they are divided into segments for activation. Peacetime CRAF operations will be compared to wartime activation and operations. Finally, it covers the activation process and the relationship between the military and civilian carriers.

## CRAF RELATIONSHIPS

The CRAF program involves several governmental agencies including the Department of Defense, the Department of Transportation and the Federal Aviation Administration (FAA). The Military Airlift Command, a component command of the United States Transportation Command (TRANSCOM), manages the CRAF program for the Department of Defense.

The Military Airlift Command, in coordination with the Unified Commanders in Chief (CINCS), determine the airlift requirements for the CINCS' war plans. Based on those determinations, MAC then tentatively sources airlift to meet those requirements. In sourcing the requirements, MAC uses its organic military capability first. Once the organic military airlift capability is exhausted, the requirement for civilian augmentation is determined. MAC forwards a request for this civil lift through TRANSCOM and the Department of Defense to the Department of Transportation, Office of Emergency Transportation (OET). The Director OET, under the authority of the 1950 Defense Production Act, allocates aircraft to the CRAF program by FAA registration number.<sup>8</sup> The Department of Transportation (DOT) considers civil airlift requirements as well as military requirements during this process. Additionally, the DOT, through the Federal Aviation Administration

" . . . provides operation support to CRAF aircraft, monitors flight times for CRAF crews, issues nonpremium Title XIII health and liability insurance coverage for activated aircraft and ensures that the carriers meet operations and safety standards . . . "9

## SEGMENTS

Aircraft allocated to the CRAF must meet certain specifications. They must be U.S. registered aircraft suitable to and capable of meeting DOD requirements. The criteria used to determine suitability are range, payload, configuration and block speed. In addition, the carrier must be able to provide four crews for each aircraft. Based on their operating characteristics, the aircraft are divided into five segments to meet specific airlift requirements. These segments include: long-range international, short-range international, domestic, Alaskan and aeromedical.<sup>10</sup>

The long-range international segment contains both passenger and cargo aircraft. These aircraft are required to have the range and must be equipped with communications and navigation equipment to fly extended overwater flights worldwide. This segment augments the MAC organic capability for long-range deployment of DOD troops and cargo during contingencies and for resupply operations.<sup>11</sup> Currently, there are approximately 250 passenger aircraft and 150 cargo aircraft in the long-range international segment. These aircraft include B-747, DC-10, L-1011, DC-8, and B-707 aircraft.<sup>12</sup>

The short-range international segment is composed of jet aircraft capable of overwater flight. This segment is designed to airlift troops and cargo to offshore areas within range and for intratheater missions compatible with the range of the specific aircraft involved. There are currently approximately 34 aircraft in the short-range international segment, mostly B-727 and B-737 type aircraft.<sup>13</sup>

The domestic segment consists of cargo-capable aircraft only. The domestic segment provides domestic logistical support for the movement of DOD cargo. There are 37 aircraft in this segment.<sup>14</sup>

Like the domestic segment, the Alaskan segment provides cargo capability within the Alaskan areas. Currently, there are four aircraft in the Alaskan segment.<sup>15</sup>

The final segment is the aeromedical segment. These B-767 and MD-82 aircraft provide international and domestic airlift for injured or wounded troops. It is composed of 31 aircraft.<sup>16</sup>

### **STAGES**

The aircraft from the different segments are distributed in three stages. Each stage responds sequentially to a higher level of emergency.

Stage I contains 18 passenger aircraft and 23 cargo aircraft, all from the long-range international segment. This stage, termed "Committed Expansion," is dedicated to the Commander, Military Airlift Command. Stage I can be used to provide passenger and cargo airlift when MAC organic assets are unable to meet requirements. The Commander of MAC has the authority to activate Stage I of the CRAF. The carriers, in turn, have 24 hours to respond after they receive notification of Stage I activation.<sup>17</sup>

Stage II is reserved for a "Defense Airlift Emergency." This stage would be required to meet the requirements of an airlift expansion short of national mobilization. The Secretary of Defense has authority to activate State II and, again, the carriers have 24

hours to respond. In addition to the 18 passenger and 23 cargo aircraft in Stage I, Stage II contains 59 more long-range international passenger aircraft, 17 more long-range international cargo aircraft, 23 aircraft in the short-range international segment, the 37 aircraft in the domestic segment and the four aircraft in the Alaskan segment.<sup>18</sup>

Stage III contains all the aircraft allocated to the CRAF program and is designed to meet " . . . National Emergencies . . . when required for DOD operations during major military emergencies involving U.S. forces."<sup>19</sup> The Secretary of Defense can activate Stage III in one of the following situations:

"(1) In time of war or during a defense-oriented national emergency declared by the President, or in time of a national emergency declared by Congress.

(2) In a national security situation short of a declared defense-oriented national emergency.

(3) Activation of CRAF Stage III presumes that the Secretary of Transportation has been authorized to exercise presidential priorities and allocation authority."<sup>20</sup>

Stage III contains the remaining aircraft listed earlier in each segment plus all the capability in the aeromedical segment. The significance of Stage III can be seen in the CRAF's overall contribution to the DOD airlift capability. Fully mobilized, 30 percent of the cargo capability and 95 percent of passenger lift comes from CRAF aircraft.<sup>21</sup>

#### **PEACETIME OPERATIONS**

While the contributions of the CRAF program are considerable,



the program remains a voluntary one in which the civil air carrier must agree to participate. What are the incentives for the carriers, and what benefits do they receive for agreeing to join CRAF?

The incentive for a carrier to be a member of CRAF is only CRAF carriers have access to DOD peacetime air transportation business. As Colonel Priddy points out:

"The business that DOD makes available to the air carrier industry is what attracts air carriers to volunteer for the CRAF program. CRAF does not operate by payoff. It operates on a volunteer basis and is contractual first."<sup>22</sup>

In fiscal year 1989, the DOD paid carriers \$618 million for services provided. This civil airlift represented 80 percent of the passengers and 30 percent of the cargo moved by the DOD that year.<sup>23</sup>

The peacetime operations and responsibilities between the DOD and the CRAF carriers are based on contractual arrangements. There are two types: the MAC Annual Airlift Services Contract or the CRAF Call Contract. The Annual Airlift Services Contract is the primary contract and " . . . is the commercial airlift procurement document that incorporates all the contractual provisions necessary to operate CRAF."<sup>24</sup> The CRAF Call Contract is used with carriers who do not have an Annual Airlift Services Contract. The Call Contract establishes a legal obligation and " . . . becomes effective upon activation of Stage III or when voluntary peacetime services are offered under the terms of the . . . contract."<sup>25</sup>

The rates paid the carriers for services are computed using a complicated formula. The rates the DOD pays:

" . . . are constructed from the carriers actual fixed and variable direct costs, indirect costs, and capital investments in the commercial market place. MAC uses the costs to develop separate passenger-seat-mile and ton-mile rates for each carrier. Next, it computes weighted averages of the individual passenger and cargo rates based upon the revenue that each carrier received from MAC in the prior year. These weighted passenger and cargo averages become the official rates paid to all carriers, for both peace-time support and wartime augmentation, during the next fiscal year. Once the aircraft are activated, carriers are paid for the actual services provided."<sup>26</sup>

The mileage used during this process is obtained from the Civil Aeronautics Board Great Circle Computed Statute Miles from airport to airport.<sup>27</sup>

Each carrier must maintain a minimum performance reliability standard to continue receiving peacetime business. The contract maintains an 80 percent schedule reliability rate as minimum. If a carrier fails to maintain an 80 percent standard for three months, the carrier can be terminated. If a carriers' performance falls below an average of 85 percent for a three-month period, the government has the option of not using that particular carrier during the month after the three-month period.<sup>28</sup>

The amount of peacetime business each carrier receives is based directly on the number and type of aircraft the carrier commits to the CRAF program. These carriers receive mobilization value points for the aircraft in CRAF Stages I and II. No mobilization value points are given for aircraft committed to Stage III only.<sup>29</sup> The mobilization value is a weighted value determined

by the adaptability of the particular aircraft to meet DOD wartime requirements. Mobilization values are computed based on aircraft range, age, payload, utilization rates, block speed, and type (cargo or passenger).<sup>30</sup> These mobilization values are used to determine each carrier's share of the annual peacetime DOD cargo and passenger business.<sup>31</sup>

### **CRAF ENHANCEMENT**

The CRAF enhancement program was started in the 1970s to increase the cargo carrying capacity and capability of the CRAF. One of the problems inherent to the program was the recognized shortfall of cargo capacity since the majority of civil carriers operate passenger aircraft. The enhancement program was an effort between the DOD and the civil carriers to modify several wide-bodied passenger aircraft to carry cargo.

The origins of the CRAF enhancement program are found in Public Law 97-86. This law authorized " . . . the Secretary of the Air Force to expand the cargo capacity of the CRAF by contracting for the modification of civil passenger aircraft to make them . . . " cargo capable.<sup>32</sup>

The first CRAF enhancement contract was awarded in 1979. The contract specified all modified aircraft had to remain committed to the CRAF for 12 to 16 years. Additionally, the contract required that the DOD be reimbursed if any of the modified aircraft were removed from the CRAF or became unavailable for use for other reasons.

A total of 23 aircraft were modified under these provisions with the last aircraft completed in 1990. Of these 23 aircraft, 19 were B-747 aircraft owned by Pan American Airways. The modifications included installation of a cargo door and strengthening the floor to withstand the additional weight of cargo. The DOD paid for the cost of these modifications and continues to pay each carrier an annual subsidy to offset the increased operating cost imposed by the added weight of these aircraft. One of the modified Pan American B-747s was destroyed in an inflight explosion over Scotland in December, 1988.<sup>33</sup>

The bankruptcy of Pan American in 1991 has impacted the availability of the remaining 18 Pan American aircraft under the terms of the original contract. This issue will be explored more in a later section.

### **CRAF ACTIVATION**

Activating the CRAF is the process by which the DOD and the civil carriers transition from normal peacetime operations to an increased operating tempo to respond to additional airlift requirements or national emergencies. The activation process and responsibilities are outlined below.

Activation is done by stages.

"The CRAF airlift capability can be activated incrementally by stages. Each stage may also be activated incrementally by the government's use of its option to select and call up only those CRAF aircraft needed to fulfill DOD requirements. The stage of the CRAF to be activated is dependent upon the amount of civil augmentation airlift needed by the DOD."<sup>34</sup>

The Military Airlift Command assesses the need for civil augmentation. If a need exists, the MAC Commander may activate Stage I on his own authority. If the need for civil augmentation exceeds the capacity of Stage I, the MAC Commander recommends to the Secretary of Defense, through USTRANSCOM and the Joint Chiefs of Staff (JCS), to declare an airlift or national emergency. If the Secretary of Defense agrees, Stage II is activated for an airlift emergency and Stage III for a national emergency. Additionally, the Secretary of Defense notifies the Secretary of Transportation of his decision. After the CRAF is activated, the JCS determines the airlift priorities to fulfill the supported warfighting CINC's requirements."<sup>35</sup>

After activation, the Military Airlift Command schedules CRAF missions based on JCS priorities while the carriers retain operational control over their assets. The MAC Crisis Action Team (CAT) director is the MAC point of contact for CRAF missions. To minimize disruptions to the carriers and to avoid cost to the government " . . . only those aircraft actually needed by MAC will be called, and only as they are needed."<sup>36</sup> Once the mission is completed, carriers may reschedule their aircraft for commercial operations if no further CRAF missions are assigned. When MAC assigns a new mission, the carriers then have 24 or 48 hours to respond, depending on the CRAF stage activated.<sup>37</sup>

As a part of the contract, carriers are required to provide all necessary support to operate missions during CRAF activations. This support includes, but is not limited to, fuel, spare parts,

maintenance and crews. The contract also requires CRAF missions to utilize civil bases to the maximum extent possible while enroute to preclude congestion at military bases.<sup>38</sup>

Communications and control between MAC and the carriers and CRAF aircraft utilize a combination of commercial and military equipment. Communications between MAC and the carriers are accomplished by commercial phone or the Aeronautical Radio, Inc. system, a hard copy communication system normally used by the civil carriers.<sup>39</sup> Flight following and control of CRAF aircraft is done through the MAC Global Decision Support System (GDSS). GDSS is a computer network to relay arrival, departure and load information for both CRAF and MAC organic aircraft to connected sites. This system is designed to provide real-time information to airlift managers and users to assist in scheduling and workloads.<sup>40</sup>

One aspect of the CRAF program which is not used during peacetime operations is the Senior Lodger concept. Senior Lodger is only activated if the CRAF is activated, and then only if Stage III is reached. Under this concept, contractually agreed to by the carriers, a specific carrier is responsible to manage and support all CRAF missions transiting a specific civil airport. This agreement specifies the carriers:

" . . . will utilize existing contracts and arrangements for aircraft servicing and support to the greatest extent possible. The Senior Lodger will be employed when such services are not available through normal commercial means. . . ."<sup>41</sup>

The carriers are reimbursed for services they provide as the Senior Lodger by means of a separate contract change order issued

by MAC.<sup>42</sup>

### **SUMMARY**

The CRAF plays a major role in the peacetime operations of the DOD as well as the wartime strategy to meet contingencies, national emergencies, and war world-wide. The revenue the carriers receive from the DOD in exchange for peacetime business is a substantial incentive encouraging their participation in the CRAF program. Simultaneously, the military receives a valuable service and gains a great deal of experience in working with the civil carriers. This experience allows the carriers and the military to transition from peacetime to wartime operations much more smoothly.

The aircraft assigned to the CRAF are picked based on their compatibility with military requirements and their capability to meet the warfighting CINCs' deployment plans. During peacetime operations, aircraft are chosen based on the particular mission and the availability of aircraft. Missions are performed based on the contractual agreements between the DOD and the carriers. During increased tensions or war, the CRAF operates at one of three stages, depending on the urgency of the situation and the scope of the military requirements. The activation of the CRAF not only increases the airlift capabilities of the United States but, in activating the CRAF, the nation also sends a strong political signal of resolve, just as it did during OPERATION DESERT SHIELD/DESERT STORM.

### INITIAL ACTIVATION

On 2 August 1990, Saddam Hussein, President of Iraq, invaded the tiny, oil-rich country of Kuwait. Within hours, Kuwait's small military had surrendered or fled south to Saudi Arabia. Hussein's publicly stated reason for invading was that Kuwait had once been a part of Iraq, and he was just correcting old mistakes and restoring things to the way they should be anyway. Probably more important to Hussein's reasoning was Kuwait's oil reserves and its strategic location on the Persian Gulf. Iraq was still recovering both economically and militarily from its eight year war with Iran from 1980 to 1988. This war had been costly to both countries. Kuwait's oil reserves would give Hussein more money to rebuild his country. More importantly from a strategic standpoint, Hussein posed a serious potential threat to Saudi Arabia and other Gulf countries, and would now control so much of the world's oil supply, he could exert major influence on international oil prices. Finally, the invasion of Kuwait posed little risk to his large military and the invasion would be a perfect opportunity to judge how other countries reacted to his incursion.

At first glance, Hussein's logic would seem rational. Kuwait was not particularly significant, especially to the United States. In fact, Kuwait had not allowed the United States to use Kuwaiti facilities during the Persian Gulf crisis of the mid 1980s. Hussein's ultimate goals may never be known. The question remains whether Kuwait was his only goal or if he had plans to drive on into Saudi Arabia's northern oil fields. Whatever he planned, he



obviously did not anticipate the United States' reaction. President Bush, fearing that Saudi Arabia, a country strategically important to the United States, was threatened, dispatched a delegation to Saudi Arabia on 4 August headed by Secretary of Defense, Dick Cheney. Using information from reconnaissance satellites, Secretary Cheney convinced King Fahd that Saudi Arabia was threatened. The photos showed Iraqi armor massed inside Kuwait just across the Saudi border. Was this a gathering offensive force to invade Saudi Arabia or a defensive force to protect Iraq's new territory? We will probably never know. On 6 August 1990, King Fahd, realizing his small military would be no match for Iraq's power, invited the United States to send forces to defend Saudi Arabia.

#### **INITIAL CIVILIAN CARRIER PARTICIPATION**

In the U.S., military planners realized if Hussein planned to continue into Saudi Arabia, reaction time was short. The call to mobilize for deployment started going out the night of 6 August 1990. Some units departed as early as 7 August 1990. The requirement for aircraft surged and some civil carriers volunteered support immediately. Part of this surge of volunteerism might have been due to the stagnant economic conditions during that period, but General Johnson (CINCTRANSCOM) made the following comments concerning this initial support:

"One critical portion of airlift in DESERT SHIELD/DESERT STORM was the contribution made by civilian air carriers. Immediately after the deployment began, civilian airlines offered their

support and the first civilian mission flew on 8 August 1990. The extent of voluntary cooperation expanded rapidly . . . "43

The airflow grew rapidly and during the first ten days the civilian carriers volunteered over 39 aircraft and flew more than 100 cargo and passenger missions to the Persian Gulf region.<sup>44</sup> One reason given for the voluntary participation was that the carriers were hoping to avoid a CRAF activation which would seriously impact their normal operations.<sup>45</sup> The deployment started in the middle of the airlines peak summer travel season and CRAF activation would hit hard.<sup>46</sup>

Requirements soon exceeded both organic military and civilian volunteer capability however. On 18 August 1990, General Johnson, with concurrence of the Chairman of the Joint Chiefs and the Secretary of Defense, activated Stage I of the CRAF. This marked the first time since the program's inception any portion of the CRAF had been activated.<sup>47</sup>

#### **STAGE I**

Aircraft committed by Stage I activation, together with other carrier volunteers previously provided from outside Stage I assets, provided the DOD and MAC a total of 68 aircraft. CRAF Stage I includes 17 long-range international passenger aircraft and 21 long-range international cargo aircraft. Volunteers provided the additional 30 aircraft: 15 passenger and 15 cargo capable aircraft<sup>48</sup> The total number of civilian aircraft supporting Operation DESERT SHIELD/DESERT STORM varied each day according to

requirements. By 8 January 1991 a total of 95 civil aircraft were flying in support of the effort.<sup>49</sup>

In the first month of activation, the CRAF flew 391 missions, 179 passenger and 212 cargo. In the second month, from 17 September to 18 October, that number declined to 274. During the third month, total CRAF missions fell to 225. From 19 November to 17 December, CRAF participation jumped back to 328 missions, and from 17 December to 16 January CRAF missions swelled to 585.<sup>50</sup> An analysis of deployment timing and decisions provides insight to these numbers.

The initial decision to activate the CRAF was based on lack of capability to meet the heavy "up front" requirements. The CRAF participation was very high as the initial forces deployed to defend Saudi Arabia. The CRAF averaged over 330 missions per month for the first two months. By mid-November, these initial forces were in-place and the CRAF missions dropped to 225 in the third month. Then on 21 November 1991, President Bush decided to deploy a second corps of 250,000 troops to the Gulf in a major switch of national strategy. The strategy had evolved from simply stopping aggression and defending Saudi Arabia to one of driving Iraqi forces out of Kuwait by offensive means if necessary.<sup>51</sup> This decision, along with continuing sustainment requirements for those troops already deployed, caused a surge in total airlift requirements. CRAF missions jumped to 328 from mid-November to mid-December and soared to 585 during the mid-December to 16 January 1991 period.

In summary, the activation of Stage I was in response to the shortage of airlift compared to requirements and the speed of the deployment as dictated by the perceived threat. The activation of Stage I had little impact on the carriers' normal operations because volunteers helped ease the burden. CRAF participation over time compares directly to deployment decisions. Participation was high during initial movement and dropped off as these forces arrived in the theater of operations. The decision to position an offensive force in the Persian Gulf drove CRAF missions back up in December and January. However, the top priority of moving men and equipment over such a long distance in such short time obscured an insidious problem which ultimately required the activation of Stage II.

## **STAGE II**

By early January, the sustainment requirements for 500,000 troops deployed 7,000 miles away from their normal logistics support bases were enormous. Additionally, the Commander in Chief, United States Central Command (CINC USCENTCOM) placed a high priority on mail and the American public responded by sending hundreds of tons of mail to the troops in the Gulf. Together, these factors generated massive amounts of cargo for air shipment. When the air campaign began the liberation of Kuwait at approximately 1900 hours Eastern time on 16 January 1991, military officials knew the need for sustainment and replacement munitions would soar. Together, these requirements exceeded the capacity of

military and CRAF Stage I resources.<sup>52</sup>

On 16 January 1991, Secretary of Defense Cheney declared an airlift emergency effective 0240 Zulu, 17 January 1991, and directed Stage II of the CRAF be activated.<sup>53</sup> Since most of the passengers to be deployed were already in-place, Stage II activation was aimed at gaining access to the cargo aircraft in Stage II.<sup>54</sup>

The decision to activate Stage II was not taken lightly. Secretary of the Air Force Donald Rice noted: " . . . there was reluctance to move to Stage II because coming in the December holiday travel season, it had the potential to disrupt the airline industry."<sup>55</sup> This might imply the requirements for Stage II were known well before Stage II was activated. It could have been a conscious decision to delay activating Stage II to the last moment to lessen the effects on the carriers during the holiday season.

#### **OVERALL CONTRIBUTIONS**

The CRAF continued Stage II operations through DESERT STORM and well into the redeployment of troops back home from the Persian Gulf region. On 16 May 1991, the Secretary of Defense authorized MAC " . . . to take necessary actions to terminate activation of CRAF Stage II effective 17 May 91."<sup>56</sup> One week later, CINCMAC determined sufficient civilian carrier volunteers were available to meet remaining requirements and ordered Stage I deactivated effective 24 May 91.<sup>57</sup> The first activation of the CRAF had come to a close, but the contributions of the CRAF and other civilian

carriers cannot be overlooked.

From activation to deactivation, the CRAF and volunteers flew over 5,400 missions and lifted 709,000 passengers and 125,000 tons of cargo. As of 1 December 1991, this civilian airlift was valued at \$1.264 billion.<sup>58</sup>

In total contributions, the civilian airlines flew approximately 20 percent of the strategic airlift missions to and from the Persian Gulf. Ms. Diane Morales summed up CRAF participation in DESERT SHIELD/DESERT STORM:

"Two thirds of all the passengers, and one-fifth of all the air cargo were moved to the Gulf by civil aircraft. More significantly, thus far, during the redeployment eighty-seven percent of the passengers and forty-three percent of the cargo has been transported by civil air carriers. We clearly could not have accomplished our mission without the CRAF, and the same will be true in future regional contingencies."<sup>59</sup>

These percentages are low by some estimates, but still they point to the importance of civilian participation. Another fact which supports the significance of these carriers is that not one company was dropped from the CRAF program during or after DESERT SHIELD/DESERT STORM because of failure to meet specified performance standards.<sup>60</sup>

#### **FOREIGN CARRIER PARTICIPATION**

DESERT SHIELD and DESERT STORM were a coalition effort. Accordingly, not all airlines which flew missions in support of DESERT SHIELD/DESERT STORM were United States companies. Failing to mention their support would be short-sighted. Alitalia, Korean

Air, Kuwait Airways, Martinair Holland, and Cargolux Airlines International combined flew 131 missions in support of the U.S. deployment and sustainment effort.<sup>61</sup> Japan, as part of its support for the coalition, contracted with foreign carriers to fly missions which allowed its national carriers to " . . . maintain their full commercial schedules."<sup>62</sup>

### **ADDITIONAL SOURCES OF AIRLIFT**

Depending on the circumstances, other sources of airlift may be available to supplement CRAF or to preclude its activation. Those sources include commercial "expansion buy," the War Air Services Program (WASP), the North Atlantic Treaty Organization (NATO) Allied Precommitted Civil Aircraft Program (NAPCAP), the Bureau of Coordination for Civil Aviation (BOCCA), the U.S.-Canadian Integrated Lines of Communication (ILOC), Korean Air Lines (KAL), or non-aligned nations. Each of these sources will be discussed briefly below.

During the initial stages of OPERATION DESERT SHIELD, before CRAF Stage I had been activated, some CRAF operators volunteered to fly missions in support of the mounting deployment. These missions were flown using "expansion buy" procedures. Essentially, this amounts to a determination by MAC that neither organic nor currently contracted civilian airlift assets are sufficient to meet the forecast needs. MAC then contractually hires additional airlift.<sup>63</sup> In some circumstances it may be the method of choice, allowing military officials to meet their needs while maintaining

a low political profile.<sup>64</sup>

The War Air Services Program consists of all registered civil aircraft with a payload capacity greater than 12,500 pounds that are not preallocated to CRAF. The objective of WASP is to maintain essential civil air routes and services, administer an air priority system, and provide parts and supplies supporting essential WASP operation. To activate WASP, all Stage III CRAF must be activated and be in use. WASP aircraft are requested on a by-mission basis through the Department of Transportation's Office of Emergency Transportation. Since this program can only be activated after CRAF Stage III, the collective impact of Stage III and WASP activations could be severe for the U.S. economy.

The NAPCAP is also commonly known as NATO CRAF. NAPCAP is activated by NATO when it decides to reinforce NATO. Because of limitations imposed by the NATO charter, NAPCAP aircraft are not available to support non-NATO contingencies. When activated, the 11 nations currently participating contribute approximately 100 aircraft.

BOCCA is a bureau of U.S. and European civil aviation experts who broker the hire (rental) of civil aircraft. The BOCCA clearing house is activated when NAPCAP is activated and, like NAPCAP, is available to support NATO scenarios only. In those scenarios, it does provide increased access to European commercial airlift capability.<sup>65</sup>

The U.S.-Canadian ILOC agreement is designed primarily to support the reinforcement of NATO. Unlike NAPCAP and BOCCA, the



ILOC is not strictly limited to a NATO scenario. Under this reciprocal agreement, both the U.S. and Canada have access to each others strategic airlift, civilian and military, to support their reinforcement activity. If the Canadians complete their movement first, their aircraft are made available to the U.S. to support our ongoing reinforcement and resupply. With announced reductions of Canadian forces stationed in Europe, it appears more likely that the U.S. would be called upon to support an early Canadian reinforcement effort rather than benefiting from any excess Canadian capacity.<sup>66</sup>

KAL makes both their passenger and cargo aircraft available to support Korean contingencies. Availability comes after the Republic of Korea makes the decision to mobilize the country. During DESERT SHIELD and DESERT STORM, KAL flew over 100 cargo missions as part of its contribution to coalition efforts.

Other allied or non-aligned nations may also be able to provide augmentation aircraft "on the fly," even without preexisting agreements. Solicitation of assistance from non-aligned nations must, however, be requested through the State Department.<sup>67</sup>

#### **SUMMARY**

The first activation of the CRAF has to be regarded as a success. The contributions of the CRAF are clear in the percentages of total missions and the number of passengers and amount of cargo carried. The performance of the carriers, overall,

was excellent. Reviewers universally agree DESERT SHIELD/DESERT STORM could not have been done without the civil carriers' participation. Clearly, any future contingency requiring a large deployment will need the civilian fleet. The CRAF has proven itself to be a major factor in the implementation of the United States' national military strategy.

But everything was not perfect. The first activation of the CRAF worked well but brought to light some areas which could be improved. Major Tom Fraley of the CRAF office at Headquarters MAC summed it up this way: "The CRAF program works but needs some adjustments."<sup>68</sup> The following section looks at those major lessons learned about the CRAF during its first activation and offers some suggestions which, if implemented before the CRAF is needed again, could make a good program even better.

### **LESSONS LEARNED**

In a presentation to the Army War College of 1992 on 7 January 1992, General Hansford T. Johnson, CINCTRANSCOM, commented on the lessons learned during the first ever activation of the CRAF. General Johnson praised the contributions of the CRAF during DESERT SHIELD/DESERT STORM but also acknowledged we must " . . . fine tune the CRAF."<sup>69</sup>

The following examines some lessons concerning the CRAF that should be addressed. These lessons can be put in five broad categories: current CRAF structure, reimbursement, under utilization of CRAF aircraft, command and control, and insurance of

CRAF assets. Recommendations on how to approach these lessons learned are provided where appropriate.

### **CURRENT STRUCTURE**

Much discussion has centered on the present structure of the CRAF and the way the program is activated in stages. The Logistics Management Institute (LMI) published a report of CRAF operations soon after DESERT SHIELD/DESERT STORM. The LMI report was highly critical of the CRAF structure observing that the CRAF activation:

"... highlighted the inflexibility of the CRAF structure to accommodate real-world conditions. The call-up of aircraft by stages proved particularly troublesome for MAC (which did not always require all the capability provided in each stage) and the carriers (whose aircraft were not always fully utilized once activated)."70

Later in the study, the authors of the LMI report amplify their remarks of the CRAF structure:

"Following MAC activation of all Stage I aircraft (17 passenger and 21 cargo) on 18 August, the cargo aircraft were immediately in high demand, with passenger aircraft needed to a lesser degree--Later in Operation DESERT SHIELD, the cargo/ passenger priorities were reversed. Such mismatches between airlift requirements and available aircraft placed unusually difficult scheduling problems on MAC and the CRAF participants. In some instances, the mismatches prevented some carriers from achieving high aircraft utilization rates."71

Ms. Diane Morales seems to agree with the LMI report in her remarks:

"We found that the existing stages were too rigid, and never really provided the correct balance between passenger and cargo aircraft. Rather than three stages, each composed of passenger and cargo aircraft, the recommendation calls for separate, independent segments for passenger, cargo and

aeromedical aircraft. Each segment would be further divided into short and long-range segments. Volunteer aircraft would be formally incorporated into CRAF, and they would be called first and released last."<sup>72</sup>

However, is the real problem the current stage structure of the CRAF or the composition of the aircraft in each stage? As pointed out earlier, when a CRAF stage is activated it means that MAC has access to the aircraft in that stage and the carriers involved have a certain amount of time (either 24 or 48 hours) to respond to MAC mission directives. When CRAF aircraft are not being used on DOD missions, the carriers may use their aircraft in normal operations. If the DOD needs only the cargo aircraft in a certain stage, then MAC can communicate to the carriers that they can continue using their passenger aircraft in normal operations without fear of disruption. If the DOD needs more cargo capacity, then the next stage can be activated, again without disrupting passenger operations. This seems to indicate the stages in the CRAF are not the problem and perhaps the number of aircraft in the first two stages needs to be addressed. MAC and the civil carriers seem to agree with this appraisal. Colonel David Morley, MAC Assistant for Force Development, discussing recent negotiations between MAC and the carriers on CRAF restructuring, noted:

" . . . . we have recommended the same three stages and the carriers--the ones we do business with--are comfortable with that. Under the current system, MAC has the flexibility to call up only passenger or only cargo aircraft in each stage. MAC did that during Operation DESERT SHIELD as requirements shifted during the build-up."<sup>73</sup>

Major General James McCombs, former MAC Deputy Chief of Staff

for Plans and Programs, agrees the problem is not the stage structure but the composition and size of the first two stages. "What we are looking at is how we can make Stages I and II larger. Basically, that would involve shifting aircraft now dedicated to Stage III into Stages I and II".<sup>74</sup>

The consensus seems to be that there is not enough cargo capability in Stages I and II of the current structure. An analysis of DESERT SHIELD/STORM showed the cargo aircraft were used very intensively and the decision to activate Stage II was based on the need for sustainment lift--a cargo aircraft requirement. However, the activation of Stage II only gained 17 long-range international aircraft to bring the total to 40. This compares to 150 in Stage III. From this analysis, it appears the real problem is lack of cargo capability in Stages I and II and not in the overall CRAF structure.

One recommendation to solve this problem is to move the current CRAF enhanced convertible cargo aircraft in Stage III to Stage II. Of the 22 remaining enhanced B-747 aircraft, 18 are committed to Stage III only. Moving these aircraft to Stage II would not only solve some of the cargo shortfall problems in Stage II but would also make these aircraft, in which the United States government has invested heavily, more accessible. The DOD should emphasize to the carriers the value of mobilization values in Stage II and the resulting peacetime business this generates. This incentive, combined with some additional annual payment, along with the current subsidies covering increased operating costs, should

provide sufficient incentive for the carriers to participate in Stage II.

A final problem does concern the present CRAF structure. Currently, the 31 aircraft in the CRAF program dedicated solely to aeromedical service are not available unless Stage III is activated. This problem could be easily solved either by making a fourth, separate aeromedical stage or by moving some of the aeromedical evacuation-committed assets forward to Stage I or Stage II. DESERT SHIELD/STORM was the largest airlift in history and Stage III was never activated. Fortunately, coalition casualties were low and the aeromedical aircraft were not needed. In the next war this may not be the case. Another reason to have a separate aeromedical segment is to respond to non-wartime events like natural disasters. Either one of these circumstances would justify a separate segment which could be activated without the danger of disrupting other aircraft.

#### **REIMBURSEMENT**

The subject of reimbursement centers on two areas. The first concerns payment for a one-way mission when in reality the carriers must pay the expenses for a round-trip. The second problem concerns lack of timely payments for additional flying activities.

The DOD and the civil carriers have set their rates in the past based on the agreed upon fact the government only pays for services from the point of embarkation to point of debarkation. These rates are quoted in terms of passenger miles or cargo ton

miles. The DOD pays based on the number of passengers or cargo tons multiplied by the rate multiplied by the miles transported. This is normally not a problem in peacetime since the carriers schedule their aircraft for revenue producing missions on the return trip. In DESERT SHIELD/STORM there was very little revenue producing activity generated in the Persian Gulf. The carriers, therefore, were forced to bear the burden of the cost of the returning flight.<sup>75</sup>

It is difficult to determine if the carriers' demands for additional payment is based on a real need for more revenue to cover cost or an after-the-war move to better their rates. The carriers need to better justify their claims before the DOD adjusts rates. One point the carriers and the DOD should keep in mind concerning this area is the amount of indirect cost savings the carriers derive from the military. The biggest perhaps is the number of trained pilots which transfer from the military to civilian carriers. The cost savings to the carriers has been enormous and they should be reminded of this benefit in rate setting discussions.

The second reimbursement issue centers on deviations in itinerary. A typical mission to the Gulf would depart from a continental United States (CONUS) location, stop for service in Europe and end at a destination in Saudi Arabia. The government paid based on the computed air miles on the two sorties or "legs" traveled. The carriers normally received payment within 30 days. A deviation occurred when, due to events beyond the carriers'

control, such as weather or airport congestion, the mission itinerary changed and the aircraft flew more air miles than the government computed. The CRAF contract has provisions to reimburse the carrier for these added costs, but the airlines complained that payments for these deviations often were delayed for months.<sup>76</sup> As of 1 December 1991, there were still over \$30 million of outstanding claims by the carriers.<sup>77</sup>

The problem of timely payments to the carriers should not be hard to solve. With available technology, it should be relatively simple to devise a way to monitor mission status and to determine when additional payments are due. The civil carriers and MAC should select a mutually acceptable method of payments and such payments not later substantiated would be refunded.

#### **CRAF UTILIZATION**

Another major concern of the civilian carriers was that their aircraft were under utilized after CRAF activation. This under-utilization affected the amount of reimbursement to the civil carriers and was a poor use of valuable airlift assets.

The DOD only paid the civil carriers for miles actually flown, thus, when carriers were deployed and operated at utilization rates below their norm, they lost money. Kevin Hall in his article "Air Force Eyes CRAF Changes to Enhance Future Cargo Capability" summed up this two edged problem:

"Several industry executives report that the military would co-opt their aircraft on 24 hours notice, only to let them sit idle for several days before deployment. In some cases, planes were



pulled out for the CRAF but were never used. Days would pass before the carriers were informed their planes weren't needed.

For some carriers, it was a double-whammy. Not only were revenue-producing planes taken out of commercial service, but as long as they sat idle, carriers weren't being paid on the Pentagon end either."<sup>78</sup>

Other carriers reported their aircraft waited up to eight hours at off-load bases in the Persian Gulf to be downloaded while military transport aircraft received priority.<sup>79</sup> There is probably some truth to these reports, but many of the delays probably resulted from inadequate training, planning and support equipment.

The Military Airlift Command is responsible for the MAC Affiliation Training program. Under this program, highly qualified airlift load planners from a sponsoring MAC Airlift Control Squadron (ALCS) visit airlift users and train their personnel in mobility planning. Each major unit of every service with a mobility requirement is affiliated with a MAC ALCS. The training includes load preparation and load planning for both organic military and CRAF aircraft. The training is conducted on a recurring basis, and additional training can be requested by the user at any time. The purpose of the training is to prepare airlift users to support themselves during future movements when trained Airlift Control Element (ALCE)<sup>80</sup> personnel may not be available at each deployment location. The success of any movement depends entirely on this pre-inspection and planning of loads.<sup>81</sup>

The MAC Affiliation Program has had two problems which affected the CRAF during DESERT SHIELD/STORM. First, MAC has not

properly emphasized the CRAF aircraft in their training since the majority of peacetime exercises use organic airlift almost exclusively. Affiliation instructors tend to concentrate on these aircraft and exclude the CRAF. When CRAF aircraft are used in exercises, MAC positions trained ALCE and aerial port personnel at operating locations to insure proper procedures are used. These people do the job the user would normally do and the user gets no training.

The second problem is a lack of priority for the Affiliation Program by the airlift user. In almost all exercises, MAC positions ALCEs at major on-load and off-load locations. The ALCE is there to assist the user, but not to do his job. The users have come to rely on the ALCE people and expect them to correct problems. As a result, airlift users often do not place a great emphasis on Affiliation training. Many of these classes are often filled by people with medical problems or those close to separating from the units.

These problems combined to cause an undesirable effect on CRAF aircraft during DESERT SHIELD/STORM. Many of the MAC ALCEs were deployed to the Persian Gulf off-load locations and were not available for the user at on-load locations. Their absence, along with the inadequate training of users in planning and loading of CRAF aircraft, caused the users many problems and delayed many CRAF missions.<sup>82</sup>

Another problem which resulted in the under-utilization of CRAF was the shortage of specialized materiel handling equipment

(MHE) needed to load and offload CRAF aircraft, in particular, wide-body-loaders. Military-designed equipment used to load and offload military aircraft was designed to be compatible with the military designed 463L cargo handling system, not commercial aircraft. The standard military design "40K" and "25K" aircraft cargo loaders, which are the workhorses of the aerial ports, do not extend high enough to reach cargo doors of CRAF's commercially designed wide-bodied aircraft like the B-747 and DC-10. This same limitation extends to organic KC-10 aircraft which are derivatives of the DC-10. Although the Air Force does own some wide-body-loaders for use with CRAF, these assets are extremely limited. Compounding the problem, neither the Cochran 316A and 316E loaders, the Wilson CL-3 loader, nor the "40K" loader extenders are compatible with the lower cargo lobes of the B-747s which must be loaded by hand to be utilized effectively. Under the current CRAF contract, it is a government responsibility to provide lower lobe loaders for wide-body aircraft operating through military installations.<sup>83</sup>

Other limitations also exist. First, although the Wilson CL-3 loader is designed as an Air Transportable Loader, it has never been certified for air transport due to "deficiencies in the loader."<sup>84</sup> In any case, this limitation is probably academic, since both the breakdown required to prepare the loader for shipment and the reassembly required at destination exceed most in-house capability and require contractor support.

The mechanical condition of the few available Cochran 316

loaders also limit their effectiveness. A scheduled rebuild was cancelled in 1989 due to contract problems, and parts support was severely limited when the sole source for repair parts was damaged by the San Francisco earthquake and remained closed for several months just preceding DESERT SHIELD. Although the Cochran loaders are mobile, the term mobile is relative. Tear down and preparation for shipment normally requires a five man crew most of one day. Reassembly prior to use requires about the same amount of time.

These loaders are positioned in a few locations and require additional airlift to position them to the airfields where they are needed. An unclassified Joint Universal Lessons Learned report confirms many CRAF missions were " . . . delayed, diverted or canceled," due to a shortage of wide-body-loaders.<sup>85</sup>

Conceptually, availability of the specialized materiel handling equipment is not a problem if CRAF operates through commercial airfields. The current CRAF contract recognizes the MHE limitation noting: "Use of wide-body aircraft is dependent upon the availability of carrier and/or government-owned MHE at onload/offload stations."<sup>86</sup> In practice, when access to commercial airfields with adequate specialized MHE is limited, shortage of this equipment becomes a serious operational constraint.

The new "60K" loader currently being developed should help alleviate this problem. Specifications requiring compatibility with all military and commercial aircraft and increased reliability and maintainability should solve two of the more vexing problems. The relative ease of preparation for air transportation and

subsequent return to service will also help resolve some of the limitations discussed above. Currently a production decision is scheduled for December 1993 with first delivery to follow in March 1995. The "60K" loader will effectively replace the current "40K" workhorse, the Wilson, and the Cochran loaders. Of a total 360 loader (260 for peacetime use, 100 for War Readiness Material) requirement, only 185 are funded.<sup>87</sup> If the full requirement is not funded, this promises to remain the ". . . weak link along this complex chain . . . which can disrupt or even halt a deployment."<sup>88</sup>

The Air Force and the airlift users can make the changes needed which would solve these problems and would therefore, allow better utilization of CRAF assets. First, the Air Force needs to emphasize the CRAF program more in Affiliation training. The course should emphasize to the user that during airlift surge operations, 95 percent of passengers and 25 to 33 percent of cargo will likely be transported by civil carriers. This emphasis should also stress to the user that MAC personnel may not be available to assist during actual contingencies and that the user must be self-sufficient.

Next, MAC should develop a Computer Assisted Load Manifesting (CALM) software package for CRAF aircraft. The only guidance currently available in military channels, MAC Pamphlet 55-41, Civil Reserve Air Fleet (CRAF) Load Planning Guide, provides only general guidance concerning loading the long-range international segment of the CRAF. Although this is probably the most demanding segment of the CRAF (from a load planning perspective), it is only one of the

five CRAF segments. The guidance provided is too general to be of any significant value. Variations in aircraft are so significant, they can only be planned specifically on a by registration number basis. A B-747 may have a side cargo door, may be equipped with a visor door, may be a stretched B-747-100 version, or have carrier-specific modifications which limit utility of sections. Detailed load planning required here is very complicated and requires weight and balance information available only from the manufacturer.<sup>89</sup> The impact here is that the users, including MAC aerial port load planners who load plan organic aircraft missions daily and who are well versed in the task, are not able to plan the load without the carriers representative. The carriers representative generally showed up several hours prior to aircraft arrival to develop the load plan, but by the time the load plan was available, users were "chasing the load," assembling equipment, marshalling loads that they were not able to preplan, and/or trying to insure everything was ready when the CRAF aircraft did arrive. In several cases, loading delays resulted.

MAC has developed and fielded CALM software for each of its organic aircraft. CALM has greatly enhanced the user's ability to load-plan for C-5, C-141, and C-130 aircraft. The unique characteristics of CRAF aircraft would complicate the data base, but do not appear to pose insurmountable problems. A request to the carriers might provide most information needed. This information could then be incorporated into current software programs and distributed to all users. When a CRAF mission is

scheduled, the FAA registration number of the aircraft could be included in the computerized mission directive and CALM would prepare a working load plan based on the characteristics of that particular airframe. If carriers are uncomfortable with military planners doing this, their carrier representatives could check the computer-based plan during the time they already allocate to preparing it. If the CALM program is properly constructed, carriers will soon develop the same high confidence the program earned with military aircrews.

The wide-body loader problem is more complex and expensive to remedy. The Air Force has purchased sufficient wide-body loaders for peacetime exercises, but the number is well short of real world and contingency requirements. The shortage revealed during Stage I and partial Stage II activation could only be exacerbated if all three stages were fully activated. The only solution is to procure the number of loaders needed and to try to develop a light weight, inexpensive, air-transportable loader which would cut-down on the amount of air-movement required. The dilemma is these loaders would not be needed in peacetime.

One solution might lie in DOD development and civilian carrier procurement. The DOD could fund a research and development program aimed at producing a loader compatible to both civilian and military missions. The civilian carriers would purchase these loaders with an understanding they would be mobilized if the CRAF is activated.

## COMMAND AND CONTROL

The command and control of CRAF aircraft while in the airlift system presented challenging problems to the airlift planners, users and carriers. The general lack of visibility of CRAF resulted in delayed missions, airport congestion and user confusion, especially during the deployment phase. The apparatus needed to correct this problem already exists. The only thing which needs to be done is to emphasize the importance of timely communications.

The scheduling of CRAF missions after activation is done by the MAC Crisis Action Team (CAT). Scheduling entails determining when the user will be ready and scheduling aircraft against the requirement. This communication between the MAC CAT and the CRAF carrier was done very well in DESERT SHIELD. The problem arose when the schedules developed to support these movements were not relayed to the operating locations. Operating locations were often unaware of scheduled CRAF arrivals or when schedule changes occurred. The result was aircraft arriving unexpectedly or different type aircraft than planned for, rendering load planning efforts invalid.<sup>90</sup>

Another area which needs improvement is incorporating CRAF movement data into the GDSS. Interviews at 21st Air Force revealed that during the deployment, personnel were so overworked, the movement information of CRAF aircraft was very often not entered into GDSS. This resulted in severe congestion at enroute and download locations when aircraft arrived unannounced and not



planned. Civil aircraft often were required to wait several hours competing for parking spots and the few wide-body-loaders available. Additionally, MAC personnel were not able to answer users' questions concerning when their missions might arrive. This did not put forth a professional image and implied the airlift was not being monitored.

The simple solution to this very vexing problem is to require Air Force and user personnel to report movement in a timely manner. Additionally, the importance of imputing this data into the proper channels must be stressed to those tasked to keep the system up. These people are often young, lower ranking people who do not completely understand how this lack of communication affects other locations and degrades overall airlift capability. This solution is a no-cost answer and is a force multiplier for airlift. Supervisors at every level in the command and control arena should make this one of their top training priorities. The Air Force has invested heavily in command and control systems and to not use them wastes these valuable resources.

### **INSURANCE**

The final lesson learned during Operation DESERT SHIELD/STORM concerning the CRAF, and possibly the most worrisome for the carriers, is the insurance coverage on CRAF assets operating during contingencies. Due to certain public law provisions and the refusal of commercial insurance companies to insure CRAF operations during DESERT SHIELD/STORM, many CRAF missions were either delayed

or canceled awaiting confirmation of insurance coverage. Some carriers may have flown missions without any insurance at all. Because of the current structure of the indemnification system, some aircraft were forced to sit on the ground while requests for insurance were forwarded, in turn, from the Air Force, to the Department of Defense, to the Department of Transportation to the Federal Aviation Administration for final approval.<sup>91</sup>

During normal peacetime operations, civil carriers purchase insurance for loss of equipment and against liability claims through commercial insurance agencies. Immediately after Iraq invaded Kuwait, and before the CRAF was activated, many of the civilian carriers were notified by their insurance companies that coverage was not available in the Persian Gulf region, or, if it was available, it was available only at significantly higher rates. Some civilian carriers actually " . . . had policies that automatically canceled any coverage for a CRAF flight."<sup>92</sup>

The government has provisions under Title XIII of the Federal Aviation Act of 1958 to provide insurance through the Federal Aviation Administration if:

- "1. The President determines that the continued operation of aircraft is necessary to carry out the foreign policy of the United States.
2. The aircraft operation is in foreign air commerce or between two or more points all of which are outside the United States.
3. The FAA Administrator finds that commercial insurance cannot be obtained on reasonable terms and conditions from any company authorized to do business in the United States."<sup>93</sup>

There are two types of Title XIII insurance available to carriers. Premium insurance, as the name implies, is available to carriers upon payment of additional premiums. During DESERT STORM the additional premiums ran as high as \$33,000 per mission and soared to \$78,000 if the aircraft stayed in the Persian Gulf region overnight.<sup>94</sup> Nonpremium insurance under Title XIII is available " . . . to air carriers flying for a federal agency that has agreed to indemnify FAA for any losses it pays." Only two agencies, the Department of Defense and the Department of State, have entered into agreements with the FAA which provide nonpremium insurance for CRAF carriers.<sup>95</sup>

There are, however, limits on both kinds of Title XIII insurance. First, as outlined in the Aviation Act of 1958, coverage is only provided " . . . between two or more points all of which are outside the United States." The stateside positioning leg and the sortie from the United States to the first refueling stop would not be covered. The lack of civil coverage and the gap in government coverage placed the CRAF carriers in a real dilemma.

A second limitation of Title XIII is that it only covers aircraft operations. This meant carrier assets on the ground are not covered, nor does Title XIII cover carrier liability for any accidents during ground operations. A final limitation is that Title XIII is only payable up to the limits of the carrier's normal peacetime commercial insurance policy.<sup>96</sup>

The indemnification clause of Public Law 85-804 was written to fill some of the voids of Title XIII insurance. Under this clause:

"The Secretary of the Air Force, pursuant to authority granted him in Public Law 85-804 can indemnify a contractor if the contractor is engaged in an unusually hazardous risk on behalf of the government. . . .

Indemnification also requires that commercial insurance not be available.

Indemnification covers such things as stateside legs of international CRAF missions; equipment, personnel, and operations at forward locations; and spare parts carried on the aircraft."<sup>97</sup>

Even with Title XIII and the indemnification clause of Public Law 85-804, limits and gaps in insurance coverage remained. Under the indemnification clause, the Secretary of the Air Force has the authority to limit coverage. In August 1990 he exercised that authority and " . . . restricted coverage to exclude normal insurance deductibles and self insurance amounts

. . . . "<sup>98</sup>

Another limitation was the failure to provide personal insurance. Indemnification insurance does not currently contain provisions to cover crew member policies who have war risk exclusions in their coverage. These crew members were forced to decide between flying without insurance or refusing to fly.<sup>99</sup> If a large number of crew members had refused to fly, the CRAF program could have been grounded.

The final indemnification problem concerns procedures for paying a carrier for a catastrophic loss. The indemnification clause provides coverage, but no money has been set aside for such payments. In the event of a sizeable award, such as the loss of an aircraft, the Department of Defense would have to seek a

Congressional appropriation to cover this unfunded expense. As of April 1991, the Department of Defense had not established a procedure with Congress whereby such an appropriation would be automatically approved so prompt payments could be made.<sup>100</sup> The carriers were concerned that if a claim was made, the time to process it would be excessive placing the carrier in a bad position financially.

The insurance problems were especially troublesome to the volunteer airlines and the airlines without an airlift contract:

"Nonpremium policies could only be issued to air carriers with DOD airlift contracts. . . . For example, the Government of Japan had approved monies to pay for US airlift through a contract with Evergreen International Airlines. Commercial insurance was cost prohibitive but the FAA could not issue Title XIII nonpremium insurance since it was authorized only for DOD 'airlift contracts.'"<sup>101</sup>

In the aftermath of DESERT SHIELD/STORM the civil carriers presented a list of insurance and indemnification issues which they want to address before the next CRAF activation:

"Carriers would like to have preapproved indemnification in the contract at the time of award so that there will be no delays in activation and their insurance and legal staffs have an opportunity to review for coverage well in advance of any activation.

Air carriers concerned that Title XIII and indemnification do not cover employee life insurance policies and health benefit policies that have war-risk exclusion. . . .

Air carriers are concerned that indemnification does not cover such things as War between the Great Powers (a standard insurance industry exclusion). . . .

They are also concerned that many flights with military passengers do not follow procedures prescribed by the Warsaw Convention/Montreal Agreement, and that they will lose legal protection of the convention.

Contracting carriers were concerned with the lack of procedures and personnel available to the Air Force for claims adjustment in case of CRAF accident.

Carriers asked whether the government could pay a large aircraft claim within insurance industry standards (48 hours)."<sup>102</sup>

CINCTRANSCOM has noted that we " . . . need to resolve insurance issues" and we " . . . need on shelf, ready to use rules."<sup>103</sup> The insurance problems and gaps in coverage which surfaced during DESERT SHIELD/STORM can and should be resolved prior to the need to activate the CRAF again. The importance of the CRAF program to national security outweighs the insurance problems which could cause some carriers to withdraw if not solved.

The Air Force should take the lead and, through coordination with the FAA which handles Title XIII insurance, rewrite the regulations so carriers would be fully covered when operating CRAF missions during contingencies and wartime. The regulations should cover civil aircraft operating CRAF missions both as volunteers and as activated CRAF carriers. The assets and the limits of liability should be plainly and clearly spelled out so there will be no doubt as to what is and what is not covered. The process of indemnification is much too complex and cumbersome to be workable in the crisis management environment which would likely accompany an airlift emergency. These provisions need to be outlined under Title XIII and become effective concurrent with the commencement of

CRAF operations.

### **FUTURE TRENDS**

CRAF has been described as a "system [which] thrives on a neat convergence of interests between peacetime aviation industry and a military that is constantly preparing for war."<sup>104</sup> There are several evolving trends, both in the civilian and military sectors, which suggest some of these interests may soon be diverging rather than converging. Some of the issues resulting have the potential to seriously degrade the CRAF program in the future if not addressed. Some of the most serious are the economic climate of the commercial airline industry, dwindling peacetime work for the CRAF carriers, foreign ownership of domestic carriers, and a lower CRAF activation threshold.

In the wake of deregulation of the U.S. airline industry in the late 1970s, the business environment has become increasingly competitive.<sup>105</sup> High labor fuel prices, a decade of languishing world trade, proliferation of anti noise regulations, and evolution of wide-body passenger aircraft have collectively exerted increasing pressures on the airlines to adopt aggressive financial management strategies.<sup>106</sup> Even with that focus, the Air Transport Association reports that U.S. flag carriers lost nearly \$2.0 billion in 1990 and 1991. Three major carriers, Pan American, Eastern, and Braniff, as well as numerous smaller airlines, have already collapsed.<sup>107</sup>

Pan American, formerly a major participant in the CRAF,

entered bankruptcy and ceased operations in late 1991. The biggest impact on the CRAF resulted from the loss of the eighteen remaining Pan Am B-747s modified under the CRAF Enhancement Program. Delta Airlines has assumed some of Pan Am's assets and has agreed to commit them to the CRAF program, and to reimburse DOD for \$25.0 million. That payment, in cash and travel credits, will offset advance payments to Pan Am for CRAF enhancement subsidies against the increased operating costs of the heavier modified airplanes.<sup>108</sup> Even with this commitment, there was a net loss of seven of the B-747 aircraft from the CRAF. This one example highlights how the CRAF is dependent on a viable airline industry.

Currently, the primary incentive for a civil carrier to participate in CRAF is the access to a share of the lucrative peacetime transportation revenue generated by the Department of Defense. As the military moves from a strategy of forward deployment to a posture of forward presence, the amount of DOD business serving as incentive for CRAF carriers will also decline. No definite dollar figures are yet available to support this trend, but estimated revenue reductions exceed a ten percent cut.<sup>109</sup> If the business declines to a point where carriers do not perceive the benefits of belonging to the CRAF to outweigh the liabilities and obligations CRAF participation entails, it is unlikely they will voluntarily continue to participate.

One possible alternative to the reduced revenues is to allow CRAF aircraft to fly an increased share of the routine channel missions currently now flown by military C-141 and C-5 aircraft.



The main reason these missions are flown by the military is to provide training to aircrews to prepare them for their wartime duties. However, the high flying time required to train these crews is rapidly aging the already old and venerable C-141 and C-5 aircraft. Transferring some additional channel missions to the civil carriers would slow the aging process of military aircraft, but would incur higher costs for an equally cost conscious military. It would also result in less opportunity for Air Force pilots to gain necessary training, a change which would reduce transport force readiness and require substantial alterations in both military training requirements and philosophy.

The irony of the problem lies in that the decision to base more troops in the continental United States versus at forward bases overseas will reduce the peacetime airlift expenses (for the DOD) and revenues (for the carriers) while at the same time it increases the contingency deployment requirements. By reducing the revenues, we may eliminate the incentive for carriers to voluntarily participate in the CRAF program at the same time our need for a viable CRAF is increasing.

Increasing foreign ownership of domestic airline companies may also pose some potential problems for CRAF in the future. Public law requires US ownership of US airline companies, but that means up to 49 percent of a company could be foreign held. As foreign investment in U.S. companies increase, the airline industry is increasingly susceptible to foreign influence. What is not clear is how a major investor could affect the decision of a company

involved in the CRAF.<sup>110</sup> If foreign investors holding significant stock in a U.S. airline participating in CRAF perceived U.S. actions to be counter to their best interests, the threat to withdraw investment from the CRAF carrier could force the carrier to stop CRAF operations for economic reasons.

With the dramatic changes in world events over the past two years, the U.S. military has revisited its strategy. Increasing domestic pressures, combined with a perceived reduction in threat, has lead to a strategy of "forward deployment" of troops being replaced by a more modest "forward presence." Even with the reduced forward presence, the current strategy retains essentially the same level of commitment to areas throughout the world, relying on strategic agility to offset reductions in presence. Under the concept of strategic agility, "The force needed to win is assembled by the rapid movement of forces from wherever they are to wherever they are needed."<sup>111</sup> To implement the strategy, the U.S. " . . . requires sufficient strategic mobility to rapidly deploy and sustain overwhelming combat power . . . [to where] . . . U.S. interests are threatened."<sup>112</sup>

Strategic mobility, for airlift forces, comes from two primary sources. Both the organic Military Airlift Command (MAC) transport force and augmentation from civil aviation, primarily CRAF, provide air assets to support the national effort. MAC is currently scheduled to receive the first delivery of what will eventually be 120 C-17As beginning in 1993. Even before the C-17A joins the MAC organic force, retirements of the first of 234 C-141Bs will begin.

Depending on the dynamics of the production of C-17s and retirements of C-141s, MACs organic capability could decline.<sup>113</sup> If that were the case, the threshold where contingency requirements exceed organic MAC capability, a condition indicating the need for CRAF activation, would come earlier.

The current CRAF contract expires 30 September 1992 and the new contract will be bid against this background and with the full realization on both the military and the civilian side of the CRAF partnership of the experience of OPERATIONS DESERT SHIELD and DESERT STORM.<sup>114</sup> Paul Hyman, Vice President of the Air Transport Association and formerly Director of Transportation Policy at DOD, notes:

"Now that we've done it for the first time ever, the benefits are more vivid than ever in everybody's mind. The carriers now know that their war risk insurance was not comprehensive, and they were actually exposed while they flew. They recognize that they lost some market share by being patriotic. Japan Airlines and Nippon Cargo came in and scooped up [1990] Christmas business while our carriers were responding to the call of the nation. These are all concerns."<sup>115</sup>

Military officials recognize the experience of DESERT SHIELD and DESERT STORM, combined with a fiercely competitive commercial environment, may have some impact on CRAF participation in the future. Major General James C. McCombs, observed "My guess would be that it [CRAF] may shrink, because six of the twelve largest airlines in the U.S. have [gone] or are going to go into bankruptcy of one form or the other."<sup>116</sup> Should participation shrink beyond the implied level, viability of program in its present voluntary

form may be impaired. If the combined organic and CRAF airlift force shrinks beyond the level where it can reasonably support the national military strategy, the choice may become do we accept the additional risk or change the nature of the CRAF program?

### **RECOMMENDATIONS**

Building on the experiences of the first activation of the CRAF, some adjustments are indicated in structure of the program, funding and financial considerations, training, and equipping the force of the future. In the area of structure, the current mix of aircraft in the various stages needs to be reviewed. Of particular concern are gaining access to more long range international cargo capable aircraft and providing some medical evacuation capability in the early stages (Stage I and Stage II). Contrary to the assertions of LMI, we believe the call up procedures are adequate and do otherwise provide the needed flexibility.

Two financial considerations, prompt payment, and expanded (or more properly comprehensive) insurance and indemnification coverage provisions are serious problems with the CRAF program from an airline perspective. They threaten to undermine carrier participation in CRAF, no matter what the incentive, if the carrier can not be reasonably assured of reimbursement for a \$300 million dollar aircraft lost while in legitimate government service.

Two weak areas involving training also exist. Reorienting MAC Affiliation Training to stress the role of CRAF as well as military aircraft in contingency operations will help better prepare airlift

users to perform their jobs. Likewise, the MAC and TRANSCOM Command and Control structures need to be better prepared to integrate and track CRAF aircraft once activated. These are both relatively low cost, but fundamental changes which need to be made.

Finally, equipping the force promises to be the most costly of the recommended fixes. The CALM program already in being needs to be expanded, along the lines previously discussed, to include planning parameters for CRAF aircraft. Only when CALM is expanded will airlift users, when properly trained, have the tools they need to do the job they are expected to do in preparation for movement.

When fully activated, CRAF adds over 500 aircraft to the military airlift system. Unless civil airfields and the associated ground handling facilities are used to their fullest, the weak point in the airlift system quickly becomes MHE. Efforts to develop and field the more capable "60K" aircraft cargo loader need to be expedited. Only when equipment of proper design to service both military and civilian aircraft is fielded in sufficient numbers to meet contingency needs will the airlift system be capable of operating at its full potential.

Finally, while CRAF has proven to be a valuable supplement to our nation's airlift system, it is not a replacement for a modern, responsive organic military airlift force. Efforts to maintain a viable military airlift fleet, and especially efforts to procure the C-17A, need to continue.

## CONCLUSION

The challenge of the future remains the same as it did when the Airlift Master Plan was first developed.

"The ability of the United States to deter aggression, limit conflict, or wage war successfully depends on our country's ability to rapidly deploy and sustain fighting units. A combat unit, however well trained and equipped, cannot and will not influence the outcome of a conflict, much less preclude it, unless its firepower is available within the battle area in the most timely manner."<sup>117</sup>

In more succinct terms, "An army division in Kansas is an effective deterrent in direct proportion to how quickly it can be deployed to a trouble spot."<sup>118</sup> With a smaller standing force in place, any significant future military efforts will more quickly require commitment of national resources, including both CRAF and reserve forces, to reach even a minimally acceptable force projection capability required by our national military strategy.

During OPERATIONS DESERT SHIELD and DESERT STORM the Civil Reserve Air Fleet proved itself as a viable concept which can contribute effectively to meeting the nation's contingency airlift needs. Although some problems, discussed here, were noted, they are generally minor and relatively easy to fix. Building on the experience of this initial activation, the CRAF program can be refined to provide an even more effective partnership for the future.

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